

CLAIMS

What is claimed is:

1. A method of aligning a video work with an audio work, wherein said audio and video works are configurable to be played in concert with each other, comprising the steps of:
 - a. automatically selecting a plurality of audio markers in said audio work, each of said selected audio markers having an audio time of occurrence associated therewith;
 - b. identifying at least one video marker within said video work, each of said identified video markers having a video time of occurrence associated therewith;
 - c. selecting one of said identified video markers and said video time of occurrence associated therewith;
 - d. selecting a video transition to apply at said selected video marker;
 - e. automatically selecting one of said plurality of audio markers, wherein said time of occurrence of said selected audio marker is proximate to said video time of occurrence of said selected video marker;
 - f. automatically synchronizing said video transition with said selected audio marker;
 - g. applying said synchronized video transition to said video work proximate to said video marker, thereby creating an aligned video work; and,
 - h. storing said aligned video work on a computer readable medium.
2. A method of aligning a video work with an audio work according to Claim 1, wherein is provided at least one audio criterion, each of said at least one audio criteria at least

comprising a rule for identifying change points within said audio work, step (a) comprises the steps of:

- (a1) selecting at least one of said provided audio criteria,
- (a2) using at least one of said selected audio criteria to identify at least two change points within said audio work,
- (a3) selecting a plurality of said at least two identified change points, thereby identifying a plurality of audio markers within said audio work.

3. A method of aligning a video work with an audio work according to Claim 2,

wherein is provided a plurality of audio criteria,
wherein is provided a priority ordering among said plurality of audio criteria,
and,

wherein step (a) comprises the steps of:

- (a1) selecting a highest priority audio criterion from among said plurality of audio criteria according to said provided priority ordering,
- (a2) using said selected audio criterion to identify at least two change points within said audio work,
- (a3) selecting a plurality of identified change points, thereby identifying a plurality of audio markers within said audio work.

4. A method of aligning a video work with an audio work according to Claim 1,

wherein is provided a criterion for determining whether an audio marker is suitable for use with a selected video marker, and,

wherein step (e) comprises the steps of:

- (e1) choosing one of said plurality of audio markers, wherein said time of occurrence of said selected audio marker is proximate to said video time of occurrence of said video marker,
- (e2) determining from said provided criterion whether said chosen audio marker is suitable for use with said selected video marker,
- (e3) if said chosen audio marker is determined to be suitable for use with said selected video marker, selecting said chosen marker,
- (e4) if said chosen audio marker is determined not to be suitable for use with said selected video marker according to said criterion, performing steps (e1) through (e3) until either one of said chosen audio markers is found to be suitable or until all of said plurality of audio markers have been chosen, and,
- (e5) if after performing steps (e1) through (e4) none of said plurality of audio markers is suitable for use with said selected video marker, taking no further action with respect to the selected video marker.

5. A method of aligning a video work with an audio work according to Claim 1, comprising the further steps of:
- (i) reading said stored aligned video work from said computer readable media; and,
 - (j) playing said aligned video work on a display device.
6. A method of aligning a video work with an audio work according to Claim 1, wherein said computer readable medium is selected from the group consisting of computer RAM, non-volatile RAM, magnetic disk, a RAM card, optical disk, magneto-optical disk, and a floppy disk.

7. A method of creating an aligned multimedia work, wherein is provided a video work comprising at least two video clips, each of said at least two video clips having a displayed length and an actual length associated therewith, and wherein is further provided an audio work, said audio and video works being configurable to be played in concert with each other, comprising the steps of:
- a. automatically determining a plurality of audio markers in said audio work, each of said audio markers having an audio time of occurrence associated therewith;
 - b. identifying at least one video marker within said video work, each of said identified video markers having a video time of occurrence associated therewith and at least one of said video markers being associated with two adjacent video clips;
 - c. selecting one of said video markers associated with two adjacent video clips, said two adjacent video clips associated with said selected video marker comprising a first earlier-occurring video clip and a second later-occurring video clip;
 - d. determining a displayed length and an actual length of said first video clip;
 - e. determining a starting time and an ending time within said video work of said first video clip;
 - f. determining a displayed length and an actual length of said second video clip;
 - g. determining a starting time and an ending time within said video work of said second video clip, said ending time of said first video clip being at least approximately equal to said starting time of said second video clip;
 - h. selecting an audio marker proximate to said ending time of said first video clip, said selected audio marker having a time of occurrence associated therewith;

- i. if said selected audio marker occurs before said ending time of said first video clip,
 - (i1) decreasing said displayed length of said first video clip until it has a new ending time at least approximately equal to said time of occurrence of said selected audio marker, and,
 - (i2) increasing said displayed length of said second video clip until it has a new starting time approximately equal to said time of occurrence of said selected audio marker, wherein said ending time of said second video clip is left at least approximately unchanged;
- j. if said selected audio marker occurs after said starting time of said second video clip,
 - (j1) increasing said displayed length of said first video clip until it has a new ending time at least approximately equal to said time of occurrence of said selected audio marker, and,
 - (j2) decreasing said displayed length of said second video clip until it has a starting time approximately equal to said time of occurrence of said selected audio marker, wherein said ending time of said second video clip is left at least approximately unchanged;
- k. performing steps (c) through (j) at least once, thereby creating an aligned video work;
- l. storing said aligned video work in a first computer readable medium; and,
- m. storing said audio work in a second computer readable medium, said aligned video work and said audio work taken together creating said aligned multimedia work.

8. A method of creating an aligned multimedia work according to Claim 7, further comprising the steps of:
- (n) reading at least a portion of said aligned video work from said computer readable medium,
 - (o) reading at least a portion of said audio work wherein said at least a portion of said audio work that is read corresponds to portion of said aligned video work that is read, and,
 - (p) playing in concert said at least a portion of said aligned video work and said at least a portion of said audio work.
9. A method of aligning a video work with an audio work, wherein said audio and video works are configurable to be played in concert, comprising the steps of:
- a. determining a plurality of audio markers in said audio work;
 - b. automatically identifying at least one video marker within said video work, wherein said at least one video marker corresponds to a discontinuity in said video work;
 - c. selecting one of said identified video markers;
 - d. selecting a video transition to apply at said selected video marker, said selected video transition having at least one transition parameter associated therewith;
 - e. selecting one of said plurality of audio markers, said selected audio marker being proximate in time to said selected video marker;
 - f. synchronizing said video transition with said selected audio marker by modifying at least one of said selected transition parameters;
 - g. applying said synchronized video transition to said video work proximate to said selected video marker according to said modified transition parameter;
- and,

- h. playing in concert said aligned video work and said audio work, thereby creating an aligned multimedia work.
- 10. A method of aligning a video work with an audio work according to Claim 9, further comprising the step of:
 - i. writing said aligned video work and said audio work to a computer readable medium.
- 11. A method of aligning a video work with an audio work according to Claim 10, wherein said computer readable medium is selected from the group consisting of computer RAM, non-volatile RAM, magnetic disk, a RAM card, optical disk, magneto-optical disk, and a floppy disk.
- 12. A method of aligning a video work with an audio work according to Claim 9, wherein is provided at least one audio criterion, each of said at least one audio criteria at least comprising a rule for identifying change points within said audio work, step (a) comprises the steps of:
 - (a1) selecting at least one of said provided audio criteria,
 - (a2) using at least one of said selected audio criteria to identify at least two change points within said audio work,
 - (a3) selecting a plurality of said at least two identified change points, thereby identifying a plurality of audio markers within said audio work.
- 13. A method of aligning a video work with an audio work according to Claim 12, wherein is provided a plurality of audio criteria, wherein is provided a priority ordering among said plurality of audio criteria, and,

wherein step (a) comprises the steps of:

- (a1) selecting a highest priority audio criterion from among said plurality of audio criteria according to said provided priority ordering,
- (a2) using said selected audio criterion to identify at least two change points within said audio work,
- (a3) selecting a plurality of identified change points, thereby identifying a plurality of audio markers within said audio work.

14. A method of aligning a video work with an audio work according to Claim 9,

wherein is provided a criterion for determining whether an audio marker is suitable for use with a selected video marker, and,

wherein step (e) comprises the steps of:

- (e1) choosing one of said plurality of audio markers, wherein said time of occurrence of said selected audio marker is proximate to said video time of occurrence of said video marker,
- (e2) determining from said provided criterion whether said chosen audio marker is suitable for use with said selected video marker,
- (e3) if said chosen audio marker is determined to be suitable for use with said selected video marker, selecting said chosen marker,
- (e4) if said chosen audio marker is determined not to be suitable for use with said selected video marker according to said criterion, performing steps (e1) through (e3) until either one of said chosen audio markers is found to be suitable or until all of said plurality of audio markers have been chosen, and,

- (e5) if after performing steps (e1) through (e4) none of said plurality of audio markers is suitable for use with said selected video marker, taking no further action with respect to the selected video marker.